

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-21. (canceled).

22. (previously presented): A group-III nitride semiconductor light-emitting device comprising a single crystal substrate, a boron phosphide (BP)-based buffer layer and a single hetero-junction light-emitting part structure, wherein the single hetero-junction light-emitting part structure containing a $\text{GaN}_{1-X}\text{P}_X$ ($0 < X < 1$) lower clad layer lying on the BP-based buffer layer, the phosphorous compositional ratio (X) of the $\text{GaN}_{1-X}\text{P}_X$ lower clad layer is set to obtain the lattice matching with the BP-based buffer layer and a $\text{Ga}_Y\text{In}_{1-Y}\text{N}$ ($0.1 \leq Y \leq 1$) light-emitting layer having a conduction type opposite the conduction type of $\text{GaN}_{1-X}\text{P}_X$ lower clad layer.

23. (currently amended): A group-III nitride semiconductor light-emitting device comprising a single crystal substrate, a boron phosphide (BP)-based buffer layer and a double hetero-junction light-emitting part structure, wherein the double hetero-junction light-emitting part structure containing a $\text{GaN}_{1-X}\text{P}_X$ ($0 < X < 1$) ~~single crystal lower clad layer as a mixed crystal of gallium nitride (GaN) and gallium phosphide (GaP)~~, the phosphorous compositional ratio (X) of the $\text{GaN}_{1-X}\text{P}_X$ lower clad layer is set to obtain the lattice matching with the BP-based buffer layer, a $\text{Ga}_Y\text{In}_{1-Y}\text{N}$ ($0 \leq Y \leq 1$) light-emitting layer and an $\text{Al}_Z\text{Ga}_{1-Z}\text{N}$ ($0 \leq Z \leq 1$) upper clad layer having a conduction type opposite the conduction type of the lower clad layer, and

wherein the boron phosphide (BP)-based buffer layer is a monolayer arranged between the single crystal substrate and the double hetero-junction light-emitting part structure, said

monolayer forming a junction interface with the single crystal substrate and having a second opposing interface with the lower clad layer.

24. (previously presented): A group-III nitride semiconductor light-emitting device according to claim 22 or 23, wherein the lower clad layer has a dislocation density of $1 \times 10^5 \text{ cm}^{-2}$ to $1 \times 10^6 \text{ cm}^{-2}$.

25. (previously presented): A group-III nitride semiconductor light-emitting device according to claim 22 or 23, wherein the lattice mismatch between the lower clad layer and the light-emitting layer is 0.3% at most.

26. (previously presented): A group-III nitride semiconductor light-emitting device according to claim 22 or 23, wherein the light-emitting layer has a dislocation density of $2 \times 10^5 \text{ cm}^{-2}$ to $1 \times 10^6 \text{ cm}^{-2}$.

27. (previously presented): A group-III nitride semiconductor light-emitting device according to claim 22 or 23, wherein the buffer layer has the lattice constant of the original crystal of the material on the buffer layer surface opposite the junction interface with the substrate and the thickness of 5 nm to 50 nm.

28. (previously presented): A group-III nitride semiconductor light-emitting device comprising a single crystal substrate, a boron phosphide (BP)-based buffer layer and a single hetero-junction light-emitting part structure, wherein the single hetero-junction light-emitting part structure containing a $\text{GaN}_{1-X}\text{P}_X$ ($0 < X < 1$) lower clad layer lying on the BP-based buffer layer and a $\text{Ga}_Y\text{In}_{1-Y}\text{N}$ ($0.1 \leq Y \leq 1$) light-emitting layer having a conduction type opposite the conduction type of $\text{GaN}_{1-X}\text{P}_X$ lower clad layer,

wherein the degree of lattice mismatch between the BP-based buffer layer and the $\text{GaN}_{1-x}\text{P}_x$ lower clad layer is about $\pm 1\%$ or less.

29. (currently amended): A group-III nitride semiconductor light-emitting device comprising a single crystal substrate, a boron phosphide (BP)-based buffer layer and a double hetero-junction light-emitting part structure, wherein the double hetero-junction light-emitting part structure containing a $\text{GaN}_{1-x}\text{P}_x$ ($0 < x < 1$) ~~single crystal~~ lower clad layer ~~as a mixed crystal of gallium nitride (GaN) and gallium phosphide (GaP)~~, a $\text{Ga}_y\text{In}_{1-y}\text{N}$ ($0 \leq y \leq 1$) light-emitting layer, and an $\text{Al}_z\text{Ga}_{1-z}\text{N}$ ($0 \leq z \leq 1$) upper clad layer having a conduction type opposite the conduction type of the lower clad layer,

wherein the degree of lattice mismatch between the BP-based buffer layer and the $\text{GaN}_{1-x}\text{P}_x$ lower clad layer is about $\pm 1\%$ or less, and

wherein the boron phosphide (BP)-based buffer layer is a monolayer arranged between the single crystal substrate and the double hetero-junction light-emitting part structure, said monolayer forming a junction interface with the single crystal substrate and having a second opposing interface with the lower clad layer.

30. (previously presented): A group-III nitride semiconductor light-emitting device according to claim 28, wherein the degree of lattice mismatch between the BP-based buffer layer and the $\text{GaN}_{1-x}\text{P}_x$ lower clad layer is about $\pm 0.4\%$ or less.

31. (previously presented): A group-III nitride semiconductor light-emitting device according to claim 29, wherein the degree of lattice mismatch between the BP-based buffer layer and the $\text{GaN}_{1-x}\text{P}_x$ lower clad layer is about $\pm 0.4\%$ or less.

32. (previously presented): A group-III nitride semiconductor light-emitting device according to claim 22 or 23, wherein the $\text{GaN}_{1-x}\text{P}_x$ lower clad layer is a single crystal layer.

33. (previously presented): A group-III nitride semiconductor light-emitting device according to claim 29, wherein the ratio (X) of the $\text{GaN}_{1-x}\text{P}_x$ single crystal lower clad layer is 0.01-0.05.

34. (previously presented): A group-III nitride semiconductor light-emitting device according to claim 29, wherein the ratio (X) of the $\text{GaN}_{1-x}\text{P}_x$ single crystal lower clad layer is 0.03-0.05.

35. (new): A group-III nitride semiconductor light-emitting device according to claim 23, wherein the BP-based buffer layer has a lattice constant which progressively changes from the junction interface with the single crystal substrate to the opposite side of the junction interface.

36. (new): A group-III nitride semiconductor light-emitting device according to claim 29, wherein the BP-based buffer layer has a lattice constant which progressively changes from the junction interface with the single crystal substrate to the opposite side of the junction interface.

37. (new): A group-III nitride semiconductor light-emitting device according to claim 35, wherein said BP-based buffer layer adopts a lattice constant approximating that of the single crystal substrate near the junction interface and an inherent lattice constant of a crystal of material constituting the buffer layer in the vicinity of the buffer layer surface opposite the junction interface with the single crystal substrate.

38. (new): A group-III nitride semiconductor light-emitting device according to claim 36, wherein said BP-based buffer layer adopts a lattice constant approximating that of the single crystal substrate near the junction interface and an inherent lattice constant of a crystal of material constituting the buffer layer in the vicinity of the buffer layer surface opposite the junction interface with the single crystal substrate.

39. (new): A group-III nitride semiconductor light-emitting device according to claim 22, wherein said boron phosphide (BP)-based buffer layer is a monolayer arranged between the single crystal substrate and the lower clad layer of the single hetero-junction light-emitting part structure, said monolayer forming a junction interface with the single crystal substrate and having a second opposing interface with the lower clad layer.

40. (new): A group-III nitride semiconductor light-emitting device according to claim 39, wherein said boron phosphide (BP)-based buffer layer is a monolayer having a thickness that does not exceed 50 nm.

41. (new): A group-III nitride semiconductor light-emitting device according to claim 23, wherein the boron phosphide (BP)-based buffer layer is a monolayer having a thickness not exceeding 50 nm.

42. (new): A group-III nitride semiconductor light-emitting device according to claim 29, wherein the boron phosphide (BP)-based buffer layer is a monolayer having a thickness not exceeding 50 nm.